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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/913,328 | 10/15/2001 | Takashi Aoki | 110356 | 8508 |

7590

01/13/2003

Oliff & Berridge
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Alexandria, VA 22320

EXAMINER

NGUYEN, HUNG

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 01/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--|------------------------------------|--|
| Office Action Summary | Application No. 09/913,328 | Applicant(s) AOKI ET AL. | |
| | Examiner Hung Henry V Nguyen | Art Unit 2851 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6,8</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-18, 21-26, 29-32 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Nishi (U.S.Pat. 6,335,787).

With respect to claims 1-2, 4-7, 9, 12-18, 21-22, 26, 29-32, Nishi discloses an exposure apparatus/corresponding method for transferring a predetermined pattern formed on a mask onto a substrate and comprising all of the limitations of the instant claims including dividing an optical path of the exposure beam from an exposure light source (2) into a plurality of partial optical paths/chambers (see figs 1, 9), and managing concentrations of an absorption substance which absorbs the exposure beam in the plurality of divided partial optical paths independently of each other by providing a plurality of different kinds of gas such as nitrogen etc... into the plurality of partial optical paths (see col.5 lines 18-52).

With respect to claims 3, 23-25, Nishi discloses the concentration of the supplied gas is controlled by a gas controller (see col.5, line 50-52).

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As to claim 8, Nishi further disclose the concentration of the supplied gas (or the kind of gas) being determined in accordance with lengths of the partial optical path (see col.27, lines 21-33; col.28, lines 14-19; lines 49-55).

As to claim 10, Nishi discloses concentration sensors (137 A-137D) for measuring the concentrations of the absorption substance in the plurality of chambers).

As to claim 11, Nishi discloses different chambers (111-115) for enclosing the illumination system, the reticle stage system unit, the projection optical system, the wafer transfer system unit and the wafer stage system unit.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 19-20, 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi (U.S.Pat. 6,335,787) in view of Miyaji et al (U.S.Pat. 5,559,584).

With respect to claims 19-20 and 27-28, Nishi discloses substantially all of the limitations of the instant claims as discussed above except for a mask library/ and or “a mask delivery space” where the concentration of the absorption substance is controlled. Miyaji discloses an exposure apparatus with an inert gas supplying means and notes “the entire optical path must be filled with inert gas such as nitrogen to avoid the decrease in transmittance of light or the generation of ozone in the exposure apparatus having a light source such as ArF excimer laser”

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(col.1, lines 65 to col.2, line 2). Miyaji further teaches a mask library (13) and “a mask delivery space” (12) and the concentration of the absorption substance of the mask delivery space is managed by controller (14) (see fig.5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Nishi and Miyaji to obtain the invention as specified in claims 19-20, 27-28 for the purpose of controlling the absorption substance and/or removing the static electricity appearing on the mask as suggested by Miyaji.

5. Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al (U.S.Pat. 6,252,648) in view of Ozawa (JP-9-162117).

With respect to claims 1-32, Hase discloses an exposure apparatus and method comprising substantially all of the basic features of the instant claims including dividing the optical path of the exposure beam from the exposure light source to the wafer into a plurality of partial optical paths (see fig.1) and providing inert gas into partial optical paths for increasing the transmittance of the exposure beams. Ozawa discloses an exposure apparatus and method for managing independently the optical density of a beam absorbing material for each of a plurality of divided optical paths. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Hase and Ozawa to obtain the invention as specified in claims 1-32. It would have been obvious to a skilled artisan to independently control the concentration of the absorption substance in the plurality of partial optical paths in the exposure device of Hase as suggested by Ozawa so that the transitivity of the exposure beam in the plurality of the partial optical paths can be independently controlled and whereby the operation cost of the exposure apparatus can be reduced.

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Prior Art Made of Record

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

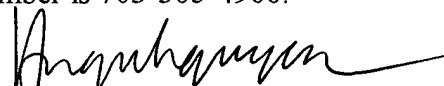
Koichi (JP-61-79228) discloses an exposure apparatus having two different types of gaseous supplier for supplying two different gaseous fluids to different interspaces of the projection optical system.

Kembo (U.S.Pat. 4,825,453) discloses an exposure apparatus having a low attenuation chamber supplied with a gas absorbing light beams.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.


Hung Henry V Nguyen
Examiner
Art Unit 2851

hvn
January 7, 2003